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ART UNIT	PAPER NUMBER
2122	

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Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/912,128	SCHMITT ET AL.
	Examiner	Art Unit	
	Chuck Kendall	2122	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>02 June 2004</u>.

2a) ☒ This action is **FINAL**.   2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>26 and 29-56</u> is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>26 and 29-56</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a) ☐ All   b) ☐ Some * c) ☐ None of:

   1. ☐ Certified copies of the priority documents have been received.

   2. ☐ Certified copies of the priority documents have been received in Application No. _____.

   3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage
   application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

Response to Amendment

1.   This action is in response to the amendment filed 06/02/2004.

2.   Previous claims 26, 29 – 50 are pending and additional claims 51 – 56 are also pending.

Claims 26, 29, 31, 33 – 34,39 – 44 and 47 have been amended and remain rejected.

3.   The amendment to the claims filed on 06/02/2004 does not comply with the requirements

of 37 CFR 1.121(c) because, Applicant on page 3 of response cancels claims 1 – 26, but amends

claims 26. Correction is required.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5.   Claims 26, 32, 38, 41, 43, and 49 – 56 are rejected under 35 U.S.C. 102(e) as being

anticipated by Leask et al. (U.S. Patent Number 6,412,106).

In regard to Claim 26, Leask anticipates a method of debugging a program for an

industrial controller having an engineering system an editor for linking graphical elements and a

runtime system represented by a flowchart visualized on a display, the including:

(a) preparing a debugging process based on the flowchart (Column 7, lines 8-20);

(b) assigning suspend command to each graphic element (Column 7, lines 29-33, also see Column 19: 1 – 7, for being able to suspend execution at any point while stepping through each block of source code);

(c) commencing the debug process (Figure 9, item 902);

(d) continuing the debugging process until a suspend command is reached (Figure 9, items 908 and 904, and associated text);

(e) displaying the location of the flowchart element corresponding to the suspend command (Column 16, lines 25-29);

(f) proceeding to the next possible suspend command (Figure 9, items 908 and 904, and associated text);

wherein a task corresponding to a graphical element of the flowchart, that has been suspended by a suspend command (16: 13 for halt execution and refer to 16: 6 for watch point, which also suspends execution), is continued by a task control mechanism of the run-time system (16: 8 – 17, see options to stop, go and step over, also see GO 412, which resumes execution).

In regard to Claim 32, Leask teaches a debugging interface available to a user at the structured textual language levels and pseudo-code level (Column 5, lines 51-57, for processor code level see Column 3, lines 10 – 15, for program image i.e. machine instructions also refer to lines 22 – 25, for program image which is generally processed by the debugger).

In regard to Claim 38, Leask teaches that a loop programming language command is in the flowchart view (Figure 3, item 34, and associated text).

In regard to Claim 41, Leask teaches that function blocks are combined into modules that are in turn presented as function blocks in a display associated with the motion control flowchart view (Column 11, lines 60-67 and Column 12, lines 1-5).

In regard to Claim 43, Leask teaches that function blocks comprise underlying source code statements (Column 11, lines 60-63), and also for display associated with the motion control flowchart, (see FIG 4, and all associated text). The examiner takes official notice that a functional block that corresponds to variable allocation has underlying source code statements that allocate variables. Further, these must be multiple statements for multiple variables, since one statement is needed for each variable allocated.

In regard to Claim 49, The method according to claim 26, wherein step a) through c) are triggered in a collective step (Column 19: 1 – 15).

In regard to Claim 50, Leask teaches that during the processing of the flowchart, a currently processed graphical element is displayed (Column 16, lines 25-29).

In regard to Claim 51, which claims similarly to claim 32 see rationale as previously discussed above.

In regard to Claim 52, which claims similarly to claim 26, see rationales as previously discussed above.

In regard to Claim 53, the method according to claim 52, wherein the programming code comprises a plurality of code level (Column, 16: 30 – 45, see underlying levels), at least a subset of the plurality of debugging processes corresponds to respective ones of the plurality of code levels, and the stop of displaying debugging processes comprises displaying at least a subset of the debugging processes on respective ones of the plurality of debugging interfaces (Column, 16: 30 – 45).

In regard to Claim 54, wherein the plurality of code levels comprises a pseudo code level and a debugging process is prepared for the pseudo code level (Examiner is interpreting the pseudo code level as claimed to be equivalent to source code level as taught in Column, 16: 30 – 35, for source code in basic could be used as pseudo code in C++ or C, here pseudo code is a general algorithm which is human readable representing the program, which is the same as source code).

In regard to Claim 55, which claims similarly to claim 26 see rationale as previously discussed above.

In regard to Claim 56, which claims similarly to claim 32 see rationale as previously discussed above.

Claim Rejections - 35 USC§ 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth

in section 102 of this title, if the differences between the subject matter sought to be patented and the prior

art are such that the subject matter as a whole would have teen obvious at the time the invention was made

to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be

negatived by the manner in which the invention was made.

7.   Claims 29-31, 36, 37, 45, and 47 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Leask et al. (U.S. Patent Number 6,412,106) in view of "ISaGRAF Overview"

by AlterSys Inc., March 2001.

          In regard to Claim 29, Leask teaches the method of Claim 26, but does not teach that the

task control mechanism of the run time system comprises breakpoint debugging where variables

can be pre-assigned by the user in the engineering system, further comprising the step of pre-

assigning variables corresponding to breakpoints. The AlterSys reference however provides a

debugger that can force the status of variables (Page 11, lines 34-35). Therefore, it would have

been obvious to one of ordinary skill in the art at the time of the invention to perform the method

of Claim 27, as taught by Leask, where the task control mechanism of the run time system

comprises breakpoint debugging where variables. van be pre-assigned by the user in the

engineering system, further comprising the step of pre-assigning variables corresponding to

breakpoints, as taught by the AlterSys reference, since this allows simulation of a program

functionality during debug.

          In regard to Claim 30, the AlterSys reference teaches that debugging is done by means of

debugging tools, and not the task control mechanism (Page 11, line 25).

          In regard to Claim 31, Leask teaches the .method of Claim 26, but does not teach

generating a structured textual language from the flowchart, converting the language into

processor-independent pseudo code, loading the code into a controller, and converting the code

in executable processor code. The AlterSys reference, however, does teach using a Structured

Text language to generate ST code from the flowchart (Page 6, lines 6-12), converting the

language into a target independent code (Page 13, line 15), loading the code into the controller

and converting the code in executable processor code (Page 13, lines 17). Therefore, it would

have been obvious to one of ordinary skill in the art at the time of the invention to perform the method of Claim 26, as taught by Leask, where the method further includes generating a structured textual language from the flowchart, converting the language into processor independent pseudo code, loading the code into the controller, and converting the code in executable processor code, as taught by the AlterSys reference, since this allows both functional programming of complex flowchart operations and virtual machine-like portability.

In regard to Claim 36, Leask teaches the method of Claim 26, but does not teach that structured text according to IEC 6-1131 is used as a structured textual language. The AlterSys reference, however, does teach using the IEC 6-1131 language as the structured textual language in flowchart programming (Page 4, lines 1-3). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to perform the method of Claim 26, where structured text according to IEC 6-1131 is used as the structured textual language, as taught by the AlterSys reference, since this is a standard in flowchart programming.

In regard to Claim 37, the AlterSys reference teaches that a user can switch between structured textual language, contact plan, and function plan as forms of representation for formulation conditions (Page 4, Figure 1).

In regard to Claim 45, Leask teaches the method of Claim 26, but does not teach that the graphical elements of the flowchart are positioned automatically. The AlterSys reference does teach this feature however (Page 4, lines 11-12). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to perform the method of Claim 26, as taught by Leask, where the graphical elements of the flowchart are positioned automatically, as taught by AlterSys, since this allows for a neater display, of the flowchart.

In regard to Claim 47, Leask teaches the method of Claim 26, but does not teach that the flowchart is displayed in a reduced form and an enlarged form. The AlterSys reference, however, does teach this feature (Page 4, lines 12-13).

8.   Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Leask et al. (U.S. Patent Number 6,412,106) in view of Hastings et al. (U.S. Patent Number 5,563,526).

In regard to Claim 33, Leask teaches the method of Claim 26, but does not teach that programming language commands are provided in the flowchart editor as a function of configuration of hardware associated with an industrial controller. Hastings, however, does teach using commands to edit a configuration of hardware (Column 30, lines 47-64). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to perform the method of Claim 26, as taught by Leask, where programming language commands are provided in the flowchart editor as a function of configuration of hardware associated with the industrial controller, as taught by Hastings, since this allows user-defined hardware configurations for performing custom functions.

9.   Claims 34, 35, 46, and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leask et al. (U.S. Patent Number 6,412,106) in view of "Siemens Industrial Software" by E&M Products, April 2001.

In regard to Claim 34, Leask teaches the method of Claim 26, but does not teach that additional graphical elements are generated in the flowchart by converting user-defined structured text subprograms of the textual language into graphical elements comprising function interfaces of the corresponding structured text subprograms. The E&M Products reference, however, does teach generating flowcharts automatically using a structured text language (Page 6, lines 6-13). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to perform the method of Claim 26, as taught by Leask, where additional graphical elements are generated in the flowchart by converting subprograms of the textual language into graphical elements comprising function interfaces, as taught by the E&M Products reference, since this allows functional programming of complex flowchart operations.

In regard to Claim 35, Leask teaches that the graphical elements are used a language elements of the flowchart, in that each element can correspond to an element of a programming language (Figure 3, items 32-38).

In regard to Claim 46, Leask teaches the method of Claim 26, but does not teach that graphical elements are linked automatically. The E&M Products reference, however, does teach automatically generating a flowchart based on a structured text language, where the flowchart

obviously contains pre-linked elements (Page 6; lines 6-13). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to perform the method of Claim 26, as taught by Leask, where graphical elements are linked automatically, as taught by the E&M Products reference, since this allows for functional programming of complex flowchart interactions.

In regard to Claim 48, Leask teaches the method of Claim 31, but does not teach retranslation back into motion control flowchart representation by means of marks in the textual language. The E&M Products reference, however, does teach translation from a structured language into a flowchart representation (Page 6, lines 6-13). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to perform the method of Claim 31, where the method further includes teach re-translation back into motion control flowchart representation by means of marks in the textual language, as taught by E&M Products, since this allows for functional programming of complex flowchart operations to be displayed for better user understanding of the operation.

10.   Claim 39, 40, 42 & 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leask et al. (U.S. Patent Number 6,412,106) in view of Sara (U.S. Patent Number 4,837,722).

In regard to Claim 39, Leask teaches the: method of Claim 39, but does not teach that a parallel branch wherein individual commands are initiated in a given interpolator cycle within a respective parallel branch. Sara, however, does teach performing operations in parallel within an interpolator cycle (Column 2, lines 45-53). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to perform the method of Claim 39, where the method further includes a parallel branch wherein individual commands are initiated in a given interpolator cycle within a respective parallel branch, as taught by Sara, since this allows for faster execution of similar instructions.

11.   Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Leask et al. (U.S. Patent Number 6,412,106) in view of Messerges et al. (U.S. Patent Number 6,295,606).

In regard to Claim 40, Leask teaches the method of Claim 26, but does not teach that parameters can be set for function blocks by mask input in the flowchart view. Messerges, however, does teach using mask input for function input parameters (Column 2, lines 64-67). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to perform the method of Claim 26, as taught by Leask, where parameters can be set for function blocks by mask input in the flowchart view, as taught by Messerges, since this aids cryptographic functions to produce more secure output.

12.   Claim 42 is rejected under 35 U. S. C. 103(a) as being unpatentable over Leask et al. (U. S. Patent Number 6,412,106) in view of "PLCopen: Standardization in Industrial Control Programming" by Eelco van der Wal, October 1999 (hereinafter Van der Wal).

In regard to Claim 42, Leask teaches the method of Claim 41, but does not teach that function blocks are interleaved in the motion control flowchart view. Van der Wal, however, does teach interleaving function blocks (Page 33). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to perform the method of Claim 41, as taught by Leask, where function blocks are interleaved in the motion control flowchart view, as taught by Van der Wal, since this allows for parallel or conditional functional blocks to exist in the flowchart.

13.   Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Leask et al. (U.S. Patent Number 6,412,106) in view of Marquardt et al. (U.S. Patent Number 4,682,278).

In regard to Claim 44, Leask teaches the method of Claim 41, but does not teach that function blocks representing functions that require a given period of time comprise advance conditions in the flowchart view. Marquardt, however, does teach a time function that requires a preset time to be entered in advance (Column 14, lines 40-47). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to perform the method of Claim 41, as taught by Leask, where function blocks representing functions that require a given

period of time comprise advance conditions in the flowchart view, as taught by Marquardt, since this allows for functions to operate for a given amount of time, or after a certain amount of time.

Response to Arguments

14.   Applicant's arguments with respect to claims 26, 29 – 50 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

15.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Chuck Kendall whose telephone number is 703-3086608. The

examiner can normally be reached on 10:00 am - 6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Tuan Dam can be reached on 703-3054552. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CK

**CHAMELI DAS
PRIMARY EXAMINER**

10/1/04